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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/738,450	12/17/2003	Toru Kuchimaru	12062-6	8093
7590 06/16/2008 Brinks Hofer Gilson & Lione P.O. Box 10395 Chicago, IL 60610				
EXAMINER				
DANIELS, ANTHONY J				
ART UNIT		PAPER NUMBER		
2622				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/738,450

**Applicant(s)**

KUCHIMARU, TORU

**Examiner**

ANTHONY J. DANIELS

**Art Unit**

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☒ Other: Marked up version of Figure of the Suh reference (US 20030219244)



## **DETAILED ACTION**

### ***Response to Amendment***

1. The amendment, filed 9/11/2007, has been entered and made of record. Claims 1-25 are pending in the application.

### ***Response to Arguments***

1. Applicant's arguments regarding the independent claims and the Suh reference have been fully considered but they are not persuasive.

The examiner submits that the guide shafts "57" are not the guide shafts cited in the Office Action as these are numbered. Accordingly, the arguments are moot. However, as per Applicant's request, the examiner has attached a marked up copy of Figure 2 showing the hanger shaft and the corresponding hole.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1,2,7-9,13,14 and 19-21 are rejected under 35 U.S.C. 102(e) as being anticipated by Suh (US 2003/0219244).

As to claim 1, Suh teaches an imaging device (Figure 2) comprising: an imaging unit having a photoelectric converter for converting an optical image into electric signal (Figure 2, CMOS module assembly “7”); an optical unit for forming an optical image of a subject on the photoelectric converter, the optical unit comprising a lens and a lens frame which supports the lens (Figure 2, lens assemblies “13” and “15”) and has a hanger shaft hole (Figure 2, hole surrounding unnumbered shaft); a chassis on which the imaging unit is mounted (Figure 2, zoom base “5” and cover “31”) and a hanger shaft is integrally formed (Figure 5), the hanger shaft being fit into the hanger shaft hole to support the lens frame so that the lens frame is capable of moving in an optical axis direction (Figure 2); and a drive unit for actuating the lens frame of the optical unit in the optical axis direction (Figure 5, power gear assembly “11”, step motor gear “21” and step motor “9”), and wherein the hanger shaft has a plurality of diameters so that the chassis side of the hanger shaft is largest and the side apart from the chassis becomes small (Figure 5; unnumbered shaft having large diameter and small diameter), and wherein the hanger shaft hole has a plurality of diameters which fit to the hanger shaft (Figure 2, hanger shaft hole has an infinite number of diameters).

As to claim 2, Suh teaches an imaging device as claimed in claim 1, wherein the hanger shaft has a first diameter and a second diameter smaller than the first diameter, and wherein the hanger shaft hole has a third diameter that fits to the first diameter of the hanger shaft and a fourth diameter that is smaller than the third diameter and fits to the second diameter of the hanger shaft (Figure 5; *Hanger shaft has an infinite number of diameters.*).

As to claim 7, Suh teaches an imaging device as claimed in claim 2, wherein the hanger shaft has a fifth diameter between portions having the first diameter and the second diameter, and

wherein the fifth diameter is smaller than the first diameter and larger than the second diameter (Figure 5; *{Hanger shaft has an infinite number of diameters.}*).

As to claim 8, Suh teaches an imaging device as claimed in claim 7, wherein the hanger shaft hole has a six diameter between portions having the third diameter and the fourth diameter, and wherein the sixth diameter is smaller than the third diameter and larger than the fourth diameter (Figure 5; *{Hanger shaft has an infinite number of diameters.}*).

As to claim 9, Suh teaches an imaging device as claimed in claim 1, wherein the hanger shaft is provided in a projected area of the imaging unit in the optical axis direction (Figure 5).

As to claims 13,14 and 19-21, the limitations of claims 13,14 and 19-21 can be found in claims 1,2 and 7-9, respectively. Therefore, claims 13,14 and 19-21 are rejected as previously discussed with respect to claims 1,2 and 7-9, respectively.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suh (US 2003/0219244) in view of Terada et al. (US 2005/0185951).

As to claim 3, Suh teaches an imaging device as claimed in claim 1. The claim differs from Suh in that it further requires that the hanger shaft have a taper between portions having different diameters.

In the same field of endeavor, Terada et al. teaches a lens barrel having two cam followers for engaging a cam. The followers having two diameters, one larger than the other, with a taper between the diameters (Figure 5, cam followers “46” and “47”). In light of the teaching of Terada et al., it would have been obvious to one of ordinary skill in the art to include the taper between the diameters in the hanger shaft hole of Suh, because an artisan of ordinary skill in the art would recognize that this would allow for a smoother and more secure fit.

As to claim 15, the limitations of claim 15 can be found in claim 3. Therefore, claim 15 is analyzed and rejected as previously discussed with respect to claim 3.

2. Claims 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suh (US 2003/0219244) in view of Terada et al. (US 2005/018951) and further in view of Hayakawa et al. (US # 7,206,109).

As to claim 4, Suh, as modified by Terada et al., teaches an imaging device as claimed in claim 3. The claim differs from Suh, as modified by Terada et al., in that it further requires that the hanger shaft hole has a taper between portions having different diameters.

In the same field of endeavor, Hayakawa et al. teaches a hole for placing an object having multiple diameters. The hole has a taper between sections having different diameters and a step between other sections having different diameters (Figure 6; Col. 9, Lines 33-38). In light of the teaching of Hayakawa et al., it would have been obvious to one of ordinary skill in the art to include this connection between the hanger shaft and the hanger shaft hole of Suh, because an artisan of ordinary skill in the art would recognize that this would allow for a secure pressed-fit between the hanger shaft and its hole (see Hayakawa et al., Col. 9, Lines 33-38).

As to claim **16**, the limitations of claim 16 can be found in claim 4. Therefore, claim 16 is analyzed and rejected as previously discussed with respect to claim 4.

3. Claims 5 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suh (US 2003/0219244) in view of Johnson (US # 5,586,654).

As to claim **5**, Suh teaches an imaging device as claimed in claim 1. The claim differs from Suh in that it further requires that the hanger shaft have a step between portions having different diameters.

In the same field of endeavor, Johnson teaches an imaging device having a locator pin with different diameters for assembling the device. The locator pins have step portions between different diameters (Figures 4-6; Col. 4, Lines 30-55). In light of the teaching of Johnson, it would have been obvious to one of ordinary skill in the art to include the step between the different diameters for the hanger shaft of Suh, because an artisan of ordinary skill in the art would recognize that this would allow for proper and secure fastening of the imaging device (see Johnson, Col. 4, Lines 50-55)

As to claim **17**, the limitations of claim 17 can be found in claim 5. Therefore, claim 17 is analyzed and rejected as previously discussed with respect to claim 5.

4. Claims 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suh (US 2003/0219244) in view of Johnson (US # 5,586,654) and further in view of Hayakawa.



As to claim 6, Suh, as modified by Johnson, teaches an imaging device as claimed in claim 5. The claim differs from Suh, as modified by Johnson, in that it further requires that the hanger shaft hole has a step between portions having different diameters.

In the same field of endeavor, Hayakawa et al. teaches a hole for placing an object having multiple diameters. The hole has a taper between sections having different diameters and a step between other sections having different diameters (Figure 6; Col. 9, Lines 33-38). In light of the teaching of Hayakawa et al., it would have been obvious to one of ordinary skill in the art to include this connection between the hanger shaft and the hanger shaft hole of Suh, because an artisan of ordinary skill in the art would recognize that this would allow for a secure pressed-fit between the hanger shaft and its hole (see Hayakawa et al., Col. 9, Lines 33-38).

As to claim 18, the limitations of claim 18 can be found in claim 6. Therefore, claim 18 is analyzed and rejected as previously discussed with respect to claim 6.

5. Claims 10-12 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suh (US 2003/0219244) in view of Kanno (US # 5,712,734).

As to claim 10, Suh teaches an imaging device as claimed in claim 1, wherein at least the drive unit is provided in a projected area of the imaging unit in the optical axis direction (see Suh, Figure 5). The claim differs from Suh in that it further requires a detector for detecting a position of at least part of the optical unit with respect to the optical axis direction.

In the same field of endeavor, Kanno teaches a zoom lens barrel comprising: a zoom lens position detector for detecting a position of a zoom lens in an optical axis direction (Col. 10, Lines 36-58; Claim 10, Lines 1 and 2). In light of the teaching, it would have been obvious to

one of ordinary skill in the art at the time the invention was made to include **the position detector in the lens barrel of Suh**, because an artisan of ordinary skill in the art would recognize that this would the camera to effectively know when the lens is at a desired position (telephoto or wide-angle).

As to claim 11, Suh, as modified by Kanno, teaches an imaging device as claimed in claim 10, wherein the drive unit comprises: a motor having a drive shaft parallel to the optical axis of the optical unit (see Suh, Figure 2, rotational shaft “17”); and a conversion mechanism (see Suh, Figure 2, power gear assembly “11”) for converting a rotational motion of the drive shaft into a linear motion in the optical axis direction (see Suh, [0062]). Although it is not stated explicitly, **Official Notice** is taken that the concept of providing a motor drive shaft for a focal or zoom lens that is perpendicular to the optical axis of an imaging device is well known and expected in the art. One of ordinary skill in the art would have been motivated to do this, because this can provide compact space by implementation above or below the lens barrel.

As to claim 12, Suh, as modified by Kanno, teaches an imaging device as claimed in claim 11, wherein the conversion mechanism comprises: a driving gear provided on the drive shaft of the motor (see Suh, Figure 5, step motor gear “21”); and a cam gear meshing with the driving gear (see Suh, Figure 5, fifth gear “41”; [0047]), having a cam surface with which a cam follower formed on an extension of the optical unit is in pressure contact (see Suh, Figure 5, gear spikes in contact with fifth gear extending from lens cam “43”), and having a shaft parallel to the optical axis of the optical unit (see Suh, Figure 2; Figure 5), and wherein at least part of the cam gear is provided in the projected area of the imaging unit in the optical axis direction (see Suh, Figure 5).

As to claims 22-24, the limitations of claims 22-24 can be found in claims 10-12, respectively. Therefore, claims 22-24 are rejected as previously discussed with respect to claims 10-12, respectively.

6. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suh (US 20030219244) in view of Hayakawa et al. (US # 7,206,109)

As to claim 25, Suh teaches an imaging device (Figure 1) comprising: a chassis (Figure 2, zoom base “5” and cover “31”) on which a hanger shaft is integrally formed (Figure 2, unnumbered shaft); an imaging unit mounted on the chassis (Figure 2, CMOS module assembly “7”); an optical unit comprising a lens and a lens frame which supports the lens (Figure 2, lens assemblies “13” and “15”) and has a hanger shaft hole (Figure 2, hole surrounding unnumbered shaft), the hanger shaft being fit into the hanger shaft hole to support the lens frame (Figure 2) so that the lens frame is capable of moving in an optical axis direction ([0065], Lines 1-8); and a drive unit for actuating the lens frame of the optical unit in the optical axis direction (Figure 5, power gear assembly “11”, step motor gear “21” and step motor “9”). The claim differs from Suh in that it further requires that the hanger shaft has a first diameter and a second diameter smaller than the first diameter, and the hanger shaft hole has a third diameter which fits to the first diameter of the hanger shaft, and a fourth diameter which is smaller than the third diameter and fits to the second diameter of the hanger shaft, and wherein the lens frame is adapted to move in the optical axis direction in a state such that the first diameter of the hanger shaft and the third diameter of the hanger shaft hole slide on each other, and the second diameter of the hanger shaft and the fourth diameter of the hanger shaft hole slide on each other.

In the same field of endeavor, Hayakawa et al. teaches a hole for placing an object having multiple diameters. The hole has a taper between sections having different diameters and a step between other sections having different diameters (Figure 6; Col. 9, Lines 33-38). The object has a first diameter (Figure 6, diameter of object whose outer edge is denoted "13c") and a second diameter smaller than the first diameter (Figure 6, diameter of object denoted by "13b") and is placed in a hole, wherein third and fourth diameters fit the first and second diameters (Figure 6), respectively. In light of the teaching of Hayakawa et al., it would have been obvious to one of ordinary skill in the art to include this connection between the hanger shaft and the hanger shaft hole of Suh, because an artisan of ordinary skill in the art would recognize that this would allow for a secure pressed-fit between the hanger shaft and its hole (see Hayakawa et al., Col. 9, Lines 33-38).

***Remarks about the rejection of claim 25: When the hanger shaft of Suh is embodied in the form of the object in Figure 6 of Hayakawa et al. and the lens assembly of Suh is formed with the hole in Figure 6 of Hayakawa et al., the connection between the chassis and the lens frame is secure. Thus, when the diameters are slid on each other, the lens frame is adapted to move in the optical axis direction.***

### ***Conclusion***

**I. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. DANIELS whose telephone number is (571)272-7362. The examiner can normally be reached on 8:00 A.M. - 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2622

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AD

5/27/2008

/Lin Ye/

Supervisory Patent Examiner, Art Unit 2622